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Elmerina fragilis sp. nov. from Central China

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Abstract — *Elmerina fragilis* (*Auriculariales*) is described and illustrated from Central China, based on morphological characters. It is characterized by an annual growth habit, pileate basidiocarps (gelatinous and flesh when fresh, becoming fragile when dry), a monomitic hyphal system with clamp connections on generative hyphae, vertically septate basidia, broadly ellipsoid basidiospores measured as 3–4 × 2–2.7 μm, and growth on a decorticated trunk of *Quercus*.

Key words — *Basidiomycota,* polyporoid fungi, taxonomy, wood-inhabiting fungi

Introduction

Elmerina Bres. is a polyporoid genus with longitudinally septate basidia, thus belonging to *Auriculariales*. The genus, typified by *Elmerina cladophora* (Berk.) Bres., is characterized by annual and corky basidiocarps, poroid to lamellate hymenophores, a dimitic hyphal system with clamp connections on generative hyphae, vertically septate basidia, and hyaline, thin-walled, allantoid to ellipsoid basidiospores (Reid 1992, Wei & Dai 2008, Zhou & Dai 2013).

Several new species of wood-decaying fungi have been found previously in Central China (Li et al. 2007, Dai et al. 2009, Zhou & Dai 2012, Zhao & Cui 2013, Shen & Cui 2014). During a continuation of polyporoid fungal research in Central China, a specimen was collected that exhibited an annual growth habit, pileate basidiocarps, a monomitic hyphal system with clamp connections on generative hyphae, vertically septate clamps, and broadly ellipsoid hyaline thin-walled basidiospores. This specimen also had gelatinous and flesh basidiocarps when fresh but became fragile when dry. Several attempts to extract its DNA have failed. Soft fruiting bodies and a monomitic hyphae system are not typical

for *Elmerina*, but the polyporoid hymenophores and vertically septate basidia make this fungus a new species closest to *Elmerina*. We describe and illustrate the new species here.

Materials & methods

Morphological studies

Sections were studied microscopically according to Dai (2010) at magnifications ≤1000× using a Nikon Eclipse 80i microscope with a phase contrast illumination. Drawings were made with the aid of a drawing tube. Microscopic features, measurements, and drawings were made from sections stained with cotton blue and Melzer's reagent. Basidiospores were measured from sections cut from the tubes. To present spore size variation, the 5% of measurements excluded from each end of the range are given in parentheses. Basidiospore spine lengths were not included in the measurements. Abbreviations include IKI = Melzer's reagent, IKI+ = amyloid, IKI– = negative in Melzer's reagent, KOH = 5% potassium hydroxide, CB = cotton blue, CB– = acyanophilous, L = mean spore length (arithmetic average of all spores), W = mean spore width (arithmetic average of all spores), Q = the L/W ratio, and n = number of spores measured from given number of specimens. Special color terms follow Petersen (1996). The type specimen is deposited in the herbarium of Beijing Forestry University, Beijing, China (BJFC).

Taxonomy

Elmerina fragilis F. Wu & Hai J. Li, **sp. nov.** FIGURES 1, 2

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Differs from other *Elmerina* species by its gelatinous and flesh basidiocarp when fresh, a monomitic hyphal system, and amyloid basidiospores.

TYPE: China. Henan Province: Neixiang County, Baotianman Nature Reserve, on fallen decorticated trunk of *Quercus*, 22.IX.2009, Dai 11267 (**holotype**, BJFC007241).

ETYMOLOGY: *fragilis* (Lat.) referring to the fragile basidiocarps when dry.

FRUITBODY. Basidiocarps annual, pileate, flesh and gelatinous when fresh, strongly crumpled and fragile when dry. Pileus circular when fresh, irregularly shaped when dry, projecting up to 1.8 cm, 2 cm wide, and 1 mm thick at center. Pileal surface orange-yellow to yellowish brown when fresh, becoming orange-brown to reddish brown and full of wrinkles when dry, glabrous. Pore surface yellowish brown when fresh, becoming brown to dark brown when dry; pores round, 5–7 per mm; dissepiments thin, entire. Context orange-brown to reddish brown, fragile when dry, ≤0.9 mm thick. Tubes brown to dark brown, fragile when dry, ≤0.1 mm long.

HYPHAL STRUCTURE. Hyphal system monomitic; generative hyphae bearing clamp connections, IKI–, CB–; tissue unchanged in KOH.

CONTEXT. Generative hyphae hyaline to pale yellowish, thin-walled, moderately branched, interwoven, 2.8–8.5 µm in diam; gloeoplerous hyphae

Figure 1. *Elmerina fragilis* (holotype): Fruiting bodies.

dominant, hyaline to pale yellowish, thin-walled, frequently branched, 1–4 μm in diam.

Tubes. Generative hyphae hyaline to pale yellowish, thin-walled, parallel along the tubes, mostly collapsed, rarely branched, 3.5–7.2 μm in diam. Gloeoplerous hyphae common, hyaline to pale yellowish, thin-walled, parallel along the tubes, unbranched, 3–7 μm in diam. Cystidia and cystidioles absent. Basidia clavate, thin to slightly thick-walled, with a vertical septate, which divides basidia into two parts, each part with two sterigmata, a basal clamp connection present, 11.5–14 × 3.7–5 μm; basidioles similar to basidia in shape, but without vertical septate and slightly smaller.

Spores. Basidiospores broadly ellipsoid, hyaline, thin-walled, smooth, IKI+, CB–, (2.8–)3–4 × 2–2.7(–2.8) μm, L = 3.51 μm, W = 2.35 μm, Q = 1.49 (n = 30/1).

Discussion

Elmerina was previously treated in *Tremellales* because of its tremelloid basidia (Bandoni et al. 1984), but phylogenetic analyses indicate that the genus is a member of the *Auriculariales* (Weiß & Oberwinkler 2001, Larsson et al. 2004, Zhou & Dai 2013).

Elmerina fragilis is distinct in the genus because of its monomitic hyphal system with both normal generative hyphae and gloeoplerous hyphae and

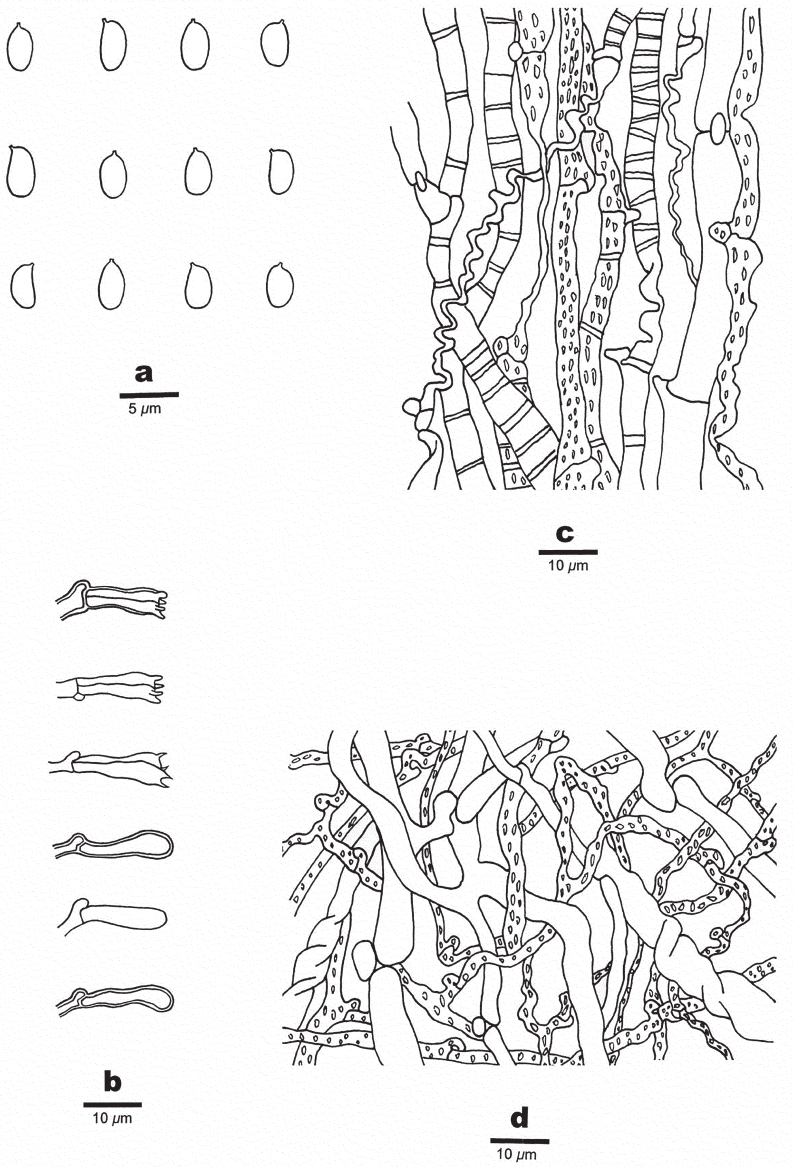

Figure 2. *Elmerina fragilis* (holotype):
a. Basidiospores. b. Basidia and basidioles.
c. Hyphae from tube trama. d. Hyphae from context.

its amyloid basidiospores. As we noted above, these characters are not found in accepted *Elmerina* species. DNA extraction from our type material was attempted several times, but failed; therefore, the phylogenetic relationships of *E. fragilis* with other taxa in *Auriculariales* remain unknown. *Elmerina fragilis* definitely belongs to *Auriculariales* based on its morphological characters, poroid hymenophores, and vertically septate basidia. For the time being, we place this species in *Elmerina* for the reason that the species is mostly close to that genus. *Protomerulius* Möller is morphologically similar to *Elmerina* (Ryvarden 1991, Reid 1992), but the two genera are phylogenetically divergent (Zhou & Dai 2013). *Protomerulius* has gloeocystidia and pear-shaped or subglobose basidia, while *Elmerina* lacks gloeocystidia and its basidia are clavate (Zhou & Dai 2013). In addition, *Protomerulius* species occur in tropical Africa and South America, whereas almost all *Elmerina* species (including the type) have been described from tropical to temperate localities in eastern and southeastern Asia. Thus, *Elmerina fragilis* has a morphology and a geographical distribution closer to *Elmerina* than to *Protomerulius*.

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